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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/661,885	09/12/2003	Charles Martin Rischar	03AB085	8511

7590 06/07/2006
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EXAMINER	
CHERY, MARDOCHEE	
ART UNIT	PAPER NUMBER
2188	

DATE MAILED: 06/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/661,885	RISCHAR ET AL.	
	Examiner	Art Unit	
	Mardochee Chery	2188	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 March 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-18 and 20-26 is/are rejected.
- 7) ☒ Claim(s) 6 and 19 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This Office Action is in response to Applicant's communication filed on March 9, 2006 in response to PTO Office Action mailed on November 7, 2005. The Applicant's remarks and amendments to the claims and/or the specification were considered with the results that follow.
2. In response to the Office Action mailed on November 7, 2005, claims 1, 7, 13, 16, 20, and 26 have been amended. Claims 1-26 remain pending.

Response to Arguments

3. Applicant argues on page 7 of the remarks that neither Vasko nor Rosenquist, alone or in combination, teaches "applying a memory lock to a program depending on whether that program is executing, much less applying the memory lock to a portion of memory holding a safety program when the safety program is not executing and removing the lock from the portion of memory holding a safety program when the safety program is executing" and "memory locking for safety applications where there is a danger of program corruption by a standard program running on the same machine that might degrade the reliability required of safety procedures", recited in claims 1 and 16.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., applying a memory lock to a program depending on whether that program is

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executing, much less applying the memory lock to a portion of memory holding a safety program when the safety program is not executing and removing the lock from the portion of memory holding a safety program when the safety program is executing and memory locking for safety applications where there is a danger of program corruption by a standard program running on the same machine that might degrade the reliability required of safety procedures) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

4. Applicant argues on page 8, paragraph 2 of the remarks that “while Rosenquist arguably provides a register somewhere that indicates a status of the memory portions, there is no indication that it is readable or any need for it to be readable”, recited in claims 7 and 20.

Examiner would like to point out that according to the “IEEE100 The Authoritative Dictionary Of IEEE Standards Terms, Seventh Edition”, a register is a device capable of retaining information like addresses or status that can be read or written. Additionally, “Online Computing Dictionary” defines a register as “addressable memory locations that can be read or written”. Therefore, there is no need for Rosenquist to explicitly mentions that the register in his system is readable because a register is by definition addressable memory locations that can be read or written.

5. Applicant argues on page 8, paragraph 4 of the remarks that "claim 26 requires both control of memory blocking based on the state of a program as executing or not, and division of tasks according to reliability requirements. Neither Rosenquist nor Vasko teach a segregation of tasks according to required reliability for loading into protected and unprotected memory".

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., control of memory blocking based on the state of a program as executing or not, division of tasks according to reliability requirements and a segregation of tasks according to required reliability for loading into protected and unprotected memory) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

6. Applicant's arguments, see page 8, paragraph 2 of remarks, filed March 9, 2006, with respect to claims 6 and 19 have been fully considered and are persuasive.

Claim Objections

7. Claims 1 and 16 are objected to because of the following informalities:
- a. in claim 1, lines 5 and 7, "and" should be inserted before –independently— and "executing" should be changed to –execute--.
 - b. In claim 16, line 8, "and" should be inserted before –providing--.
- Appropriate correction is required.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-5, 7-8, 10-13, 15-18, 20-21, 23-24 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vasko (2003/0208283) in view of Rosenquist (2002/0133680) and further in view of (Applicant Admitted Prior Art, hereinafter APA).

As per claim 1, Vasko discloses a safety controller comprising: a processing unit having a processor executing instructions, and a memory holding instructions and data, wherein the memory is adapted to hold a standard program and safety program, the safety program requires higher reliability execution than the standard program [Figs. 2 and 5; pars. 2, 22, 42-43, 48, 51].

However, Vasko does not specifically teach the processing unit providing a hardware lock preventing writing of at least a portion of the memory as controllable by a lock instruction; and a lock management program executable on the processing unit unlocks a portion of memory holding the safety program at times when the safety program is executing and locking the portion of memory at other times as required by the claim.

Rosenquist discloses the processing unit providing a hardware lock preventing writing of at least a portion of the memory as controllable by a lock instruction [par.16]; and a lock management program executable on the processing unit unlocks a portion of memory holding the safety program at times when the safety program is executing and locking the portion of memory at other times [pars. 8-9 and 25] to prevent writing to the memory portion (par.16).

Since the technology for implementing a safety controller with the processing unit providing a hardware lock preventing writing of at least a portion of the memory as controllable by a lock instruction was well known as evidenced by Rosenquist, an artisan would have been motivated to implement this feature in the system of Vasko to prevent writing to the memory portion. Thus, it would have been obvious to one of ordinary skill in the art, at the time of invention by Applicant to modify the system of Vasko to include the processing unit providing a hardware lock preventing writing of at

least a portion of the memory as controllable by a lock instruction because this would have prevented writing to the memory portion (par.16) as taught by Rosenquist.

However, Vasko and Rosenquist do not specifically teach independently executing a standard program providing control for an industrial process and a safety program providing control of safety equipment and providing human safety in an environment of the industrial controller as required.

APA discloses independently executing a standard program providing control for an industrial process and a safety program providing control of safety equipment and providing human safety in an environment of the industrial controller [pars. 4-5 and 8-9] to ensure the safety of humans working in the environment of and industrial process (par. 5).

Since the technology for implementing a controller with independently executing a standard program providing control for an industrial process and a safety program providing control of safety equipment and providing human safety in an environment of the industrial controller was well known as evidenced by APA, an artisan would have been motivated to implement this feature in the system of Vasko and Rosenquist in order to ensure the safety of humans working in the environment of and industrial process. Thus, it would have been obvious to one of ordinary skill in the art, at the time of invention by Applicant, to modify the system of Vasko and Rosenquist to include independently executing a standard program providing control for an industrial process and a safety program providing control of safety equipment and providing human safety

in an environment of the industrial controller since this would have helped insuring the safety of humans working in the environment of and industrial process (par. 5) as taught by APA.

As per claim 2, Rosenquist discloses the portion of memory also holds data operated on by the safety program [par. 7].

As per claim 3, Vasko discloses I/O circuitry exchanging input/output values with an external machine and wherein the data includes input/output values [Fig.6].

As per claim 4, Rosenquist discloses the lock management program executable on the processing unit is different from the safety program [pars. 8-9 and 25].

As per claim 5, Rosenquist discloses the lock management program executable on the processing unit is an operating system running on the processing unit and scheduling the execution of the safety program and standard program [par. 6].

As per claim 7, Rosenquist discloses lock instruction is a setting of a register indicating the status of different memory portions as locked and unlocked [par. 21].

As per claim 8, Rosenquist discloses the hardware lock operates so that the

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locked portion of memory may be read [Fig.2, par. 7].

As per claim 10, Rosenquist discloses the lock management program executes to keep the portion of memory holding the standard program unlocked [par. 9].

As per claim 11, Rosenquist discloses the lock management program is a portion of the safety program unlocking the memory portion at the start of safety program and locking the memory portion at the conclusion of the safety program [pars. 7 and 23].

As per claim 12, Vasko discloses the portion of memory holding the safety program also holds a copy of selected data generated by the standard program [Fig.6, par. 75].

As per claim 13, Rosenquist discloses a lock check program periodically checking the status of the portion of memory holding the safety program when a safety program is not executing and invoking an error if the memory portion holding the safety program is unlocked [pars. 20 and 28].

As per claim 15, Rosenquist discloses the second processing unit provides a hardware lock preventing writing of at least a portion of the memory adapted to hold a copy of the safety program as controllable by a lock instruction [par.16].

As per claim 16, the rationale in the rejection of claim 1 is herein incorporated. Vasko further discloses loading a first portion of memory with a standard program and a second portion of memory with a safety program, the safety program requiring higher reliability execution than the standard program [Figs. 2 and 5; par. 63].

However, Vasko does not specifically teach executing the safety program and standard program at different times and unlocking the second portion of memory at times when the safety program is executing and locking the second portion of memory at other times as required by the claim.

Rosenquist discloses executing the safety program and standard program at different times and unlocking the second portion of memory at times when the safety program is executing and locking the second portion of memory at other times [Fig. 1; pars. 7-8 and 18-19] to prevent writing to the memory portion (par. 16).

Since the technology for implementing a safety controller with executing the safety program and standard program at different times and unlocking the second portion of memory at times when the safety program is executing and locking the second portion of memory at other times was well known as evidenced by Rosenquist, an artisan would have been motivated to implement this feature in the system of Vasko to prevent writing to the memory portion. Thus, it would have been obvious to one of ordinary skill in the art, at the time of invention by Applicant to modify the system of Vasko to include executing the safety program and standard program at different times

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and unlocking the second portion of memory at times when the safety program is executing and locking the second portion of memory at other times because this would have prevented writing to the memory portion (par.16) as taught by Rosenquist.

As per claim 17, Rosenquist discloses the second portion of memory also holds data operated on by the safety program [par. 7].

As per claim 18, Vasko discloses the safety controller includes I/O circuitry exchanging input/output values with an external machine and wherein the data includes input/output values [Fig.6].

As per claim 20, Rosenquist discloses lock instruction is a setting of a register indicating the status of different memory portions as locked and unlocked [par. 21].

As per claim 21, Rosenquist discloses the hardware lock operates so that the locked portion of memory may be read but not written [Fig.2, par. 7].

As per claim 23, Rosenquist discloses the lock management program executes to keep the portion of memory holding the standard program unlocked [par. 9].

As per claim 24, Rosenquist discloses periodically checking the status of the second portion of memory when a safety control program is not executing and invoking

an error if the memory portion is unlocked [pars. 20 and 28].

As per claim 26, Vasko discloses a method of operating a safety controller system comprising the steps of: accepting program instructions from a user describing the logical combination of input sensor data to produce output control data [par.3].

However, Vasko does not specifically teach collecting the program instructions into logical tasks; identifying the task as to one of two levels of reliability, a first level being of higher reliability than the second level;

Rosenquist discloses collecting the program instructions into logical tasks [par. 25]; identifying the task as to one of two levels of reliability, a first level being of higher reliability than the second level [par. 28]; loading a task of the first level into a first portion of memory and a task of the second level into a second portion of memory [pars. 18-19]; executing the loaded tasks at different times and unlocking the first portion of memory at times when the task of the first level is executing and locking the second portion of memory at other times [pars. 8-9 and 25] to prevent writing to the memory portion (par.16).

Since the technology for implementing a safety controller with loading a task of the first level into a first portion of memory and a task of the second level into a second portion of memory was well known as evidenced by Rosenquist, an artisan would have been motivated to implement this feature in the system of Vasko to prevent writing to

the memory portion. Thus, it would have been obvious to one of ordinary skill in the art, at the time of invention by Applicant to modify the system of Vasko to include loading a task of the first level into a first portion of memory and a task of the second level into a second portion of memory because this would have prevented writing to the memory portion (par.16) as taught by Rosenquist.

10. Claims 9 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vasko (2003/0208283) in view of Rosenquist (2002/0133680) and APA as applied to claims 1 and 16 above, and further in view of Gafken (6,026,016).

As per claims 9 and 22, Vasko, Rosenquist and APA disclose the claimed invention as discussed above in the previous paragraphs. However, Vasko, Rosenquist and APA do not specifically teach the hardware lock operates so that different portions of memory may be simultaneously locked and unlocked as required by the claim.

Gafken discloses the hardware lock operates so that different portions of memory may be simultaneously locked and unlocked [Fig. 3] to disable and enable write, erase, and read operations to the blocks of memory (col.1, lines 9-10).

Since the technology for implementing a safety controller with the hardware lock operates so that different portions of memory may be simultaneously locked and unlocked was well known as evidenced by Gafken, an artisan would have been

motivated to implement this feature in the system of Vasko, Rosenquist and APA since this would have disabled and enabled write, erase and read operations to the blocks of memory. Thus, it would have been obvious to one of ordinary skill in the art at the time of invention by Applicant to modify the system of Vasko, Rosenquist and APA to include the hardware lock operates so that different portions of memory may be simultaneously locked and unlocked because this would have enabled and disabled write, erase and read operations to the blocks of memory (col.1, lines 9-10) as taught by Gafken.

11. Claims 14 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vasko (2003/0208283) in view of Rosenquist (2002/0133680) and APA as applied to claims 1 and 16 above, and further in view of Danielsen (5,136,704).

As per claims 14 and 25, Vasko, Rosenquist and APA disclose the claimed invention as discussed above in the previous paragraphs. Vasko further discloses a second processing unit having a processor executing instructions, and a memory adapted to hold a copy of the safety program [Figs.2; pars. 22, 42-43].

However Vasko, Rosenquist and APA do not specifically teach a synchronization program executable by the processing units to execute the safety program on both processing units and compare execution of the safety programs and to enter a safety state when this execution differs as required by the claim.

Danielsen discloses a synchronization program executable by the processing units to execute the safety program on both processing units and compare execution of the safety programs and to enter a safety state when this execution differs [Fig.3; col. 5, lines 25-45] to identify a faulty condition between the processing units (col. 5, lines 36-40).

Since the technology for implementing a safety controller with a synchronization program executable by the processing units to execute the safety program on both processing units and compare execution of the safety programs and to enter a safety state when this execution differs was well known as evidenced by Danielsen, an artisan would have been motivated to implement this feature in the system Vasko, Rosenquist and APA since this would have helped identified a faulty condition between the processing units. Thus, it would have been obvious to one of ordinary skill in the art at the time of invention by Applicant to modify the system of Vasko, Rosenquist and APA to include a synchronization program executable by the processing units to execute the safety program on both processing units and compare execution of the safety programs and to enter a safety state when this execution differs because this would have identified a faulty condition between the processing units (col. 5, lines 36-40) as taught by Danielsen.

Allowable Subject Matter

12. Claims 6 and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

14. When responding to the office action, Applicant is advised to clearly point out the patentable novelty that he or she thinks the claims present in view of the state of the art

disclosed by references cited or the objections made. He or she must also show how the amendments avoid such references or objections. See 37 C.F.R. 1.111(c).

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mardochee Chery whose telephone number is (571) 272-4246. The examiner can normally be reached on 8:30A-5:00P.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Manonama Padmanabhan can be reached on (571) 272-4210. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

May 20, 2006



Mardochee Chery
Examiner
AU: 2188


5/24/06

MANO PADMANABHAN
SUPERVISORY PATENT EXAMINER